

in which was the following passage: 'Have you seen any unusual appearances in the sky lately? For some time past in this country an extraordinary red glow has been seen in the sky just before sunrise and just after sunset. It seems to have been noticed all over India and in Egypt also, but I do not know if it has been seen in Europe. The natives are full of superstitious fears on account of it. No one, so far as I know, has been able to account for it, but several theories, more or less absurd, have been started, one trying to connect it with the eruption in Java, another with the spots on the sun, and so on. I do not know what it can be, but it is certainly very remarkable, and I never saw anything like it before.'

A correspondent of the *Times* sends the following extract from the *Gold Coast Times* of September 14. The phenomena alluded to were seen at Cape Coast Castle:—"On the 1st or 2nd of this month the sun was described as being blue in the morning. It seems it rose as usual, and that the clouds which passed over it, from their greater rarity or density, gave it different apparent shades of rose colour, pink, and so on. After the passage of the clouds its appearance through the haze was white like the moon. In fact, an Englishman is said to have taken it for the moon."

In Paris also, and elsewhere in France, the phenomenon has been very striking.

A correspondent writing from Croydon to the *Standard*, under date November 26, says:—"At half-past three this afternoon the sky in the west quickly assumed a deep red colour, which, after some minutes, spread over the sky to a considerable distance, tinging it with a pale pink colour. This, again, in a few minutes, disappeared, and the sky assumed its normal condition."

Another correspondent on the same date, from Derby, states:—"This evening we have witnessed a most remarkable sunset, the sky being lit up with a pale bluish-yellow light, changing to orange and red."

Again, a correspondent to the same paper writing on November 28 from Skegness, Lincolnshire, says:—"Here, in the fens of Lincolnshire, where gorgeous sunsets are the rule, the phenomenon has been most remarkable, and each evening since Sunday last the heavens have presented an appearance both interesting and awe inspiring. On Monday evening last, when the sun set at 3.57, the western heavens were all aglow until 6.30, and the rich, lurid glare of the 'after-glow' had all the appearance of an immense illumination, the rays of which, starting from the direction of the setting sun as a centre, extended well towards the zenith. The most remarkable thing was the fact that whilst the western sky was thus all aglow the stars in the northern heavens were shining as brilliantly as at midnight. The 'blood-red' appearance has been repeated during the rest of this week. The effect was altogether different from the 'Aurora Borealis,' there being an utter absence of the peculiar scintillation common to that phenomenon."

From Eastbourne, according to a correspondent there, "a considerable space above the hills where the sun had disappeared was a clear sky with no tinge of red in it, but a pale greenish-blue transparency, to describe which I can find no precise words. Across this there floated three or four opaline cloudlets, while a great mass of violet-coloured vapour lay piled up in the south-west. Above the pale and clear transparency was a broad zone of rose-colour, which seemed denser here and there, and also appeared to shoot upwards in tongue-shaped undulations. As the evening advanced, and the true sunset, at 3.57, took place, the clear sky disappeared, as if drawn down behind the hills, which the rosy zone now touched, and was gradually drawn down in its turn, but remained unfaded to the last."

Mr. Sydney Hooper, writing to the *Standard* from Ealing, says:—"In none of the correspondence on the subject of the remarkable sunsets we have had lately have

I seen any reference to what strikes me as the most curious fact in connection with them, and which in my experience is quite unique. I have observed sunsets carefully for the last thirty years, and I have invariably found that the crimson glow is the last; coming usually a considerable time after the yellow glow has faded. The crimson light is always followed by the cold gray which precedes the night, as many must have observed when the rosy light dies out from an Alpine peak. For the last few evenings, however, notably on Wednesday night, there has been a reversal of this rule. A yellow glow has first overspread the sky, extending almost to the zenith. This has gradually deepened to orange, then to crimson. The crimson has then gathered in intensity towards the horizon until it has become a deep, rich, horizontal bar, lingering long after sunset. Then came the effect which I refer to as unique. After the crimson had died away, the west was again lit up by a deep orange glow extending over half the sky, so intense in colour that the lamps showed as white light against it. This second glow is to me unaccountable, and indicates a very peculiar condition of the atmosphere. Another fact, equally remarkable, was that the whole effect was reproduced the following (Thursday) morning, but the order of the tints was, of course, reversed. At a quarter to six an exact reproduction of the orange tint of the previous evening was seen in the south-eastern sky. This was followed by the deep crimson bar low down in the horizon. Then the crimson gradually passed upwards, giving place finally to the greenish yellow with which the phenomena commenced in the evening."

#### NOTES

It is proposed to hold, during the year 1884, an International Exhibition, which shall also illustrate certain branches of health and education, and which will occupy the buildings at South Kensington erected for the International Fisheries Exhibition. The object of the Exhibition will be to illustrate, as vividly and in as practical a manner as possible, food, dress, the dwelling, the school, and the workshop, as affecting the conditions of healthful life, and also to bring into public notice the most recent appliances for elementary school teaching and instruction in applied science, art, and handicrafts. The influence of modern sanitary knowledge and intellectual progress upon the welfare of the people of all classes and all nations will thus be practically demonstrated, and an attempt will be made to display the most valuable and recent advances which have been attained in these important subjects. The Exhibition will be divided into two main sections, Division I. Health, Division II. Education, and will be further subdivided into six principal groups. In the first group it is intended specially to illustrate the food resources of the world, and the best and most economical methods of utilising them. For the sake of comparison, not only will specimens of food from all countries be exhibited, but the various methods of preparing, cooking, and serving food will be practically shown. The numerous processes of manufacture connected with the preparation of articles of food and drink will thus be exemplified; and, so far as the perishable nature of the articles will admit, full illustrations will be given of the various descriptions of foods themselves. In the second group, dress, chiefly in its relation to health, will be displayed. Illustrations of the clothing of the principal peoples of the world may be expected; and a part of this Exhibition, which, it is anticipated, will be held in the galleries of the Royal Albert Hall, will be devoted to the history of costume. In the third, fourth, and fifth groups will be comprised all that pertains to the healthful construction and fitting of the dwelling, the school, and the workshop; not only as respects the needful arrangements for

sanitation, but also the fittings and furniture generally in their effect on the health of the inmates. The most improved methods of school construction will be shown, and the modes of combating and preventing the evils of unhealthy trades, occupations, and processes of manufacture will form portions of the Exhibition. The sixth group will comprise all that relates to primary, technical, and art education, and will include designs and models for school buildings; apparatus and appliances for teaching; diagrams, text-books, &c. Special attention will be directed to technical and art education, to the results of industrial teaching, and to the introduction of manual and handicraft work into schools.

ON the 22nd ult. the remainder of the furniture and stores for Ben Nevis Observatory were carried to the top under great difficulties. The party had intended to make the ascent at the beginning of the week, but, owing to the state of the weather, they could not think of it. On Thursday morning, however, although the weather was not very favourable, it was decided to make the ascent, and at 9 a.m. Mr. James M'Lean, contractor, and Alex. Turban, who is in charge of the stores, along with two assistants, started with some chairs and other stores. The first part of the journey was easily accomplished. The snow lay pretty heavy down to within a mile of Achintee farmhouse, and several deep wreaths were encountered before reaching the lake. On reaching the Red Burn they came upon a long wreath of about fourteen feet deep. The snow being somewhat soft, the party had to cut a passage through, which was a rather difficult task. Determined if possible to reach the top, they proceeded slowly, and, as they ascended, the snow was found to be deeper, in which they sometimes sank to their shoulders. Parts where the wind had driven off the snow were covered with ice, rendering the path difficult and dangerous. Their efforts were, however, ultimately crowned with success, for at 2.30 p.m., five and a half hours after starting, the party reached the Observatory. The average depth of snow on the level parts on the summit was about six feet, and round about the Observatory it was eight feet. Mr. Omond and his assistants were in excellent spirits, are very comfortable, and now feel quite at home. The party started on the return journey at 3.30, and Fort William was reached at 6.30 p.m., the whole journey, including a stay of an hour at the Observatory, occupying nine hours.

WE regret to learn of the death, on the 30th ult., of the celebrated Swedish zoologist, Prof. Sven Nilsson, of the Lund University, at the age of ninety-seven.

M. RENARD has communicated recently (November 3) to the Royal Academy of Brussels the results of a chemical and microscopic examination of the ashes from the great eruption of Krakatoa, which fell at Batavia on August 27 last. He finds that the volcanic dust consists mainly of glassy particles, among which may be distinguished crystals of plagioclase, often in rhomboidal lamellæ, augite, rhombic pyroxene, and magnetite. The rock which has been blown into this finely divided state presents the general mineralogical composition of the augite-andesites, but with a rather higher proportion of silica, which, on analysis, was found to amount to 65 per cent. of the whole.

A MEETING will be held on Friday at the rooms of the Royal Society, Burlington House, Piccadilly, when it will be proposed to appoint a Committee, and to make such other arrangements as may be considered necessary for the successful promotion of the William Spottiswoode Memorial Fund. The chair will be taken by Prof. Huxley, President of the Royal Society, at four o'clock precisely.

THE members of the Polar meteorological station which Denmark maintained at Godthaab in Greenland under the international scheme, have just returned to Copenhagen. The chief

of the expedition, Lieut. A. Paulsen, reports that, having left Copenhagen on May 18, 1882, in the sailing ship *Ceres*, they arrived at Godthaab on June 14. On the voyage out observations of the temperature of the sea and air were made every hour. On the arrival out the expedition had to select the most suitable spot for the erection of the four wooden buildings brought with them, in which the magnetic and astronomical observations were to be made. A small mountain ridge near the church in the colony was chosen for this, as the preliminary researches in its neighbourhood showed that the influence of iron strata on the magnetic current was here very small. The buildings were then erected and the pillars raised on which the transit instrument, the great astronomical clock, and the eight different magnetical instruments were mounted, and simultaneously the instruments for the meteorological observations were also placed so that the weathercock and the anemometers, as well as the thermometer hut, were situated as free as possible. On August 1 the meteorological observations could be commenced, but the magnetic ones were through an accident delayed until the 7th. From that date complete observations were made in exact accordance with the international programme without interruption every hour until August 31 this year, and the expedition has thereby fully accomplished its object, viz. of obtaining a full year's magnetical and meteorological observations in this locality. A number of other scientific researches have also been pursued, of which those on the aurora borealis should particularly be mentioned. This phenomenon was frequently observed and studied during the winter, while some exceedingly valuable statistics were obtained as to the altitude of the aurora borealis above the earth's surface by measurements effected simultaneously in various places by light signals. The measurements of atmospheric electricity have also led to valuable results. It is stated to have been the best equipped Polar expedition ever despatched from Denmark. We hope soon to give further details.

THE following communication from Mr. Charles Ford, of the Botanic Garden, Hong Kong, dated October 3, 1883, has been forwarded to us from Kew for publication:—"By the s.s. *Laertes* which left this place for London last week I have sent two Wardian cases of live plants, one case of living orchids, and a case of herbarium specimens, which I brought back from the Lo-Fan Mountains up the East River, and distant about sixty miles from Canton, where I spent about three weeks in August. On this excursion I travelled over about eighty miles of country after leaving the river, and consequently had a considerable amount of trouble when the natives knew I had no boat to fall back upon, and was therefore very much in their hands. I intended to make another trip up the North River during this month, but that is now impossible, as Dr. Hance, who is Acting Consul at Canton, will not apply to the Viceroy for passports for any one, and he says he is afraid it will be a long time before he will feel at liberty to do so. You have no doubt heard of the very serious trouble at Canton, in which a riot occurred and nearly twenty European residences were attacked and burnt down by the Chinese and the valuable contents of the houses carried off by the mob. There is a very hostile feeling to foreigners prevailing now amongst the Chinese, and it is considered quite unsafe to travel in the country. I was in the Lo-Fan Mountains when the trouble at Canton commenced, but no one attempted to molest me, and I returned to Canton in a passage junk with 150 Chinese on board, and no foreigner besides myself; since then, however, matters have become much worse. Mr. Sampson's herbarium and house were burnt when his house was set fire to, and Dr. Hance's, which was not more than fifty yards off, might easily have shared the same fate, but very fortunately it was spared. Dr. Hance is extremely busy with official matters, and he thinks it will be a long time before he can resume botanical work. There is an encampment of 1000



Chinese troops in the foreign settlement at Canton, and five foreign and about a dozen Chinese gunboats in the river opposite to it: all these for the protection of the foreign residents and their property. The missionaries have left the country districts, and do not expect to be able to return for many months. These things will prevent any botanical work being done in China for some time. I hope something may be done in Formosa in the beginning of next year."

LARGE use is made at the Forth Bridge Works of electricity for lighting purposes. At South Queensferry the workshops are lit up by sixteen arc lights, supplemented by a certain number of movable small incandescent lights. Outside twelve large arc lights serve to illuminate the various lines of rails and the approaches to the workshops. The offices, canteen, and other buildings are lighted throughout with Swan incandescent lights of 20-candle power, over 200 being there alone required for the purpose. The staging, which, beginning near the Hawe's Pier, extends for nearly half a mile into the Firth, has, with its approaches, twelve large lights devoted to its illumination. On the island of Inch Garvie in mid channel, four large arc lights are in use outside, and small incandescent lights in the offices and workshops, in the old castle, and in the neighbouring buildings. At North Queensferry six large arc lights serve for the outside illumination, and a number of incandescent lights for that of the interior of the offices and workshops. Nowhere is a dangerous degree of electric pressure allowed; and in all interiors, workshops, or operations under water the limit is but little more than one-half of that permitted by the Board of Trade in their provisional orders for dwellings in towns.

THE mathematical magazine conducted under the name of the *Analyst* for the past ten years, by Mr. J. E. Hendricks, will, we learn from *Science*, be continued under the editorial charge of Ormond Stone, Professor of Astronomy, and William M. Thornton, Professor of Engineering, with the title, *Annals of Mathematics, Pure and Appld.* The numbers will be issued at intervals of two months, beginning February 1, 1884. In scope the journal will embrace the development of new and important theories of mathematics, pure and applied; the solution of useful and interesting problems; the history and bibliography of various branches of mathematics; and critical examinations and reviews of important treatises and text-books on mathematical subjects. The office of publication will be at the University of Virginia.

DR. HOLUB has left England on his expedition to the interior of Africa. He leaves for this journey of a year accompanied by his wife and eleven good servants, including a carpenter, a waggonmaker, a blacksmith, a gunmaker, a tailor, and a butcher, besides his black servant-girl and a dog. In South Africa he will increase his staff by nineteen, and afterwards in Central Africa by forty more black servants.

It is reported from the Storelvdal, a valley in Central Norway, between 61° and 62° N. lat., that the snow during the night of November 17 became covered with a gray and black layer of dust. No scientific investigation of the phenomenon has as yet been effected.

THE report of the death of Julius Payer, the discoverer with Weyprecht of Franz Josef Land, is, we are glad to say, without any foundation.

THE Annual Report for 1882-83 of the Liverpool Geological Association reports favourably, we are glad to see, on the position and work of that society.

THE Report of the Smithsonian Institution for 1881 shows how admirably that many-sided organisation continues to carry on its invaluable work. The museum in its various departments is constantly increasing; the library will soon be almost without

a rival; while a successful chemical laboratory has been added to the other resources of the institute. The appendix, containing as it does a record of progress in all departments of science by specialists, is of great utility; while the special papers on anthropology continue to be a well-known feature of the Report. The Report, like the Institution, reflects the greatest credit on its secretary, Prof. Spencer Baird.

THE additions to the Zoological Society's Gardens during the past week include a Moorhen (*Gallinule chloropus*), British, presented by Mr. T. E. Gunn; two Common Wolves (*Canis lupus* ♂ & ♀), European, a Dufresne's Amazon (*Chrysotis dufresniana*) from South-East Brazil; a Bell's Cinixys (*Cinixys belliana*) from West Africa, two Carp (*Cyprinus carpio*) from British fresh waters, purchased; an Indian Gazelle (*Gazella bennettii*), born in the Gardens.

### OUR ASTRONOMICAL COLUMN

VARIABLE STARS.—The following are Greenwich times of geocentric minima of *Algol*, during the first quarter of 1884: the later observations of Prof. Julius Schmidt have been brought to bear upon the predictions.

	h. m.		h. m.		h. m.
Jan. 10 ...	13 35	Feb. 2 ...	12 9	March 13 ...	15 38
13 ...	10 24	5 ...	8 58	16 ...	12 28
16 ...	7 13	8 ...	5 47	19 ...	9 17
30 ...	15 19	22 ...	13 53		
		25 ...	10 43		
		28 ...	7 32		

According to Mr. Knott's observations of U Cephei, 1881-1883, a minimum is indicated on January 5 at 15h. 21m. G.M.T., the period being 2d. 20h. 48'9m. The ephemeris published in the *Vierteljahrsschrift* gives it 1h. 10m. earlier; but it is not stated upon what elements this rests.

Minima of S Cancri occur on December 31 at 8h. 41m., January 19 at 7h. 57m., February 7 at 7h. 12m., and February 26 at 6h. 28m. G.M.T.

The fine variable R Leonis will be due at maximum on February 23, and *Mira Ceti* on March 11.

THE FIRST COMET OF 1798.—A recalculation of the elements of the orbit of this comet, made by Mr. Hind from Messier's observations on April 12, 13, 14, May 1, 2, 3, and May 20, 21, 22, as they are given in Zach's *Allgemeine Geographische Ephemeriden*, vols. i. and ii., does not lead to any suspicion of ellipticity, which is rather confirmatory of the view taken by Dr. Harzer as to its non-identity with the greatly perturbed comet of Brorsen (1846 III) to which reference was lately made in *NATURE*. The new orbit is as follows:—

Perihelion passage 1798, April 4<sup>h</sup> 51<sup>m</sup> 48<sup>s</sup> Paris M.T.

Longitude of perihelion ... ..	105° 5' 43"	} Mean
„ ascending node ... ..	122° 7' 22"	
Inclination ... ..	43° 48' 1"	} Equinox
Log. perihelion distance ... ..	9 <sup>h</sup> 6857689	
Motion—direct.		

The error in longitude for the second normal is -19"; the latitudes agree.

THE GREAT COMET OF 1882.—We do not hear that this comet has been recognised since its conjunction with the sun. As was pointed out in this column, it was just possible that it might have been re-observed as the earth somewhat overtook it in its orbit, between the beginning of September and the end of last month. On November 30 the distance was at a minimum of 5'708, and is once more on the increase.

The comet was seen at the Observatory of Cordoba until June 1; the last complete observation for position was made there on May 26, when the distance from the earth was 5'048. There is no parallel to this in the whole history of cometary astronomy, except in the case of the very exceptional comet which was observed in 1729 and 1730; at the time of Cassini's last observation this body was distant from the earth 5'135.

Between the first accurate observation at the Royal Observatory, Cape of Good Hope, on September 7, 1882, and the Cordoba observation above referred to on May 26, 1883, the